Not Even Wrong

Requiem for a Field?

Posted on July 26, 2026 by woit

Kevin Hartnett posted the following Friday:

> *My profile of @Jacob_Tsimerman, published the morning he won the Fields Medal, and hours before he announced he's going to @OpenAI, reads like a requiem for a field.*

While I'm trying to not spend too much time thinking about the ongoing story of the effect of AI agents on math, the story of Jacob Tsimerman's Fields medal award coinciding with his announcement that he's leaving research math to go work of OpenAI is hard to ignore. If you do want to spend time thinking about the implications of this, it's worth reading the profiles at the New York Times as well as Hartnett's at Quanta Magazine. Also very much worth reading is Tsimerman's own explanation (in an exchange with Daniel Litt) of how he sees things. This was written before the OpenAI announcement, but goes a ways towards explaining Tsimerman's decision.

A few personal comments: I've never had any interest in the kind of problem-solving Tsimerman specializes in, so have no idea if he's right that humans will no longer be able to compete with the AI agents in this area within the next few years. His current situation makes him a very special case. In the Quanta profile he explains that he quit math competitions once he got a perfect score at the 2004 IMO, figuring it best to stop at the top of his game. Winning a Fields medal puts one in an analogous situation professionally: there are lots more awards you could get, but that's the big one.

In addition, while a Fields medal comes with academic job offers that allow one to do whatever one wants and be very well-paid to do it, our tech overlords at OpenAI can and do pay a great deal more.

Finally, if you're the competitive sort, what's happening is making competitive problem solving much less attractive. It's not just that the AI agents may beat you, it's that the game is now being played very differently. When you're competing against other mathematicians, there are strong norms about crediting ideas to those who came up with them, something that AI agents have no interest in doing. The situation isn't quite like the situation in chess, where powerful chess programs got to the point they could beat humans, but human to human chess competition survived. Where we're going could be analogous to chess playing where everyone is using, with or without acknowledging it, some sort of chess program. "Winning" at this will be something very different than pre-AI.

My own interests are quite different than Tsimerman's. Math competitions never had any appeal to me. This was partly because I've never been competitive or much interested in "winning" anything. Also, why spend time on intricate math problems chosen mainly because they could be expressed in elementary terms and solved by elementary methods when there is so much beautiful and powerful non-elementary mathematics to learn about? As one learns mathematics there are always new depths to explore, and these depths seem to contain unexpected ideas that explain what is going on in fundamental theoretical physics, a subject with its own challenging depths to explore. So far I haven't seen AI agents doing anything new and important that I would care about, but maybe that's just a matter of time...

Update: Timothy Gowers (another Fields medalist and IMO winner with a perfect score) has a long blog post with his thought about the Leiden declaration at his blog.

Update: For an interview with Tsimerman at the ICM, see here.

Update: OpenAI has a promotional video for a program offering free access to their frontier models. Three of the four scientists featured are prominent theoretical physicists who had been working on string theory (Xi Yin and Eva Silverstein) or SUSY (Nathaniel Craig).

Update: Two new things this morning:

- An interview with Tsimerman at the Atlantic
- A new hep-th arXiv paper that demonstrates clearly why, in an intellectually dead field, AI will just produce worthless junk. If what you feed it is decades of complicated and meaningless computations, it will just produce even more complicated and meaningless ones.

Update: Yet another Tsimerman interview, at the Wall Street Journal.

This entry was posted in Uncategorized. Bookmark the permalink.

16 Responses to *Requiem for a Field?*

Anonymous *says:*
July 26, 2026 at 3:34 pm

I can't quite be sure, but I think you misunderstood Jacob Tsimerman's post you are responding to. The "problem-solving" he is discussing as being opposed to "theory-building" is not "competitive problem solving" (as in the IMO etc), but the problem-solving one encounters while doing mathematical research. This is a well-known way to look at things in mathematics (see for example https://www.reddit.com/r/mathematics/comments/mqgqbh/giancarlo_rota_on_problem_solvers_vs_theorizers/) even if one does not necessarily agree with it.

Peter Woit *says:*
July 26, 2026 at 4:05 pm

Anonymous,
Thanks! My intention was to just place Tsimerman on the "problem-solving" end of the problem-solving vs. theory-building continuum, without getting into an explanation of that. For that, his own comments at the X post are excellent, e.g. about the way even theory builders need to do some problem solving.

I've deleted the adjective "competitive" I'd added to "problem-solving", because it confuses things. The intention was to point to my impression that for problem solvers like Tsimerman, there is often a "competitive" aspect, with roots in their earliest experiences solving problems in competitions. I was relying somewhat on Hartnett's description:

"What he loves most is to solve hard problems, and to be the first to do so."

which portrays his problem-solving as having a competitive aspect. But I don't know him and in his own description of himself as a problem-solver he doesn't refer to that aspect. I do think though the "competitive" aspect of problem-solving is an important part of the story, so wrote a paragraph about this. If you just want to solve problems, there's not an obvious issue with having a new tool to help you. But if there's a competitive aspect, and you want not just to solve problems, but to get credited as the person who solved the problems, then this new tool poses serious issues.

Anonymous *says:*
July 26, 2026 at 8:06 pm

I know Jacob Tsimerman a bit, and I don't think we should take him as a barometer of what is happening more broadly. He is an unusual person even by general standards: extremely hyper, someone who likes to try different things and do them well — a black belt in judo, a piano player, someone who does improv, a co-writer of a play, and someone who loves to cook almost professionally.

I think he may simply need to try something new at this point in his life. We also don't know what he will be doing in two years, when he might get bored with (let's be honest) pretty boring technicalities of ai and ai safety, especially when you have to wait nine months for the next frontier model to be trained and it still cannot solve your favorite problem.

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mawir *says:*

July 27, 2026 at 5:51 am

In my opinion, the big AI breakthroughs in mathematics say more about the psychology of professional mathematics than anything about the AI supremacy. AI biggest results so far have been (as far as I know) limited to finding counter examples to conjectures that were widely held to be true (the Erdos unit distance problem and the Jacobian conjecture); sharpening bounds on existing results and finding better algorithms.

These are the sort of results that are not particularly deep but are psychologically difficult for humans to work on. No professional mathematician wants to spend six months grinding through the technical details of a plausible conjecture looking for a counter-example or marginally improving a lower bound on a highly technical theorem. And even if they are willing, the incentives of academia would likely make it very difficult for most academics to `waste time` on such a project.

This actually makes me feel more positive about the future of AI assisted mathematics, if we can set AI to the task ruling out plausible but false conjectures, it will free up mathematicians to work on problems where progress is possible. I imagine tens of thousands of research-hours have been wasted trying to prove the Jacobian conjecture over the last ~150 years.

But I fully understand why a working mathematician wouldn't wont to stay in such a field, where AI quickly resolves most new speculative conjectures and proves all the technical lemmas, leaving a limited number of very difficult, highly abstract problems for the humans to think about. More worringly, I have no idea how academia reacts to this. What happens when AI can produce most of the results that make up the largely worthless research papers that academics are forced to publish to satisfy arbitrary targets for tenure?

Nachi *says:*

July 27, 2026 at 7:24 am

I would dare to say that Tsimemrma's comments on problem-solving vs. theory-building reflect very little on the real nature of mathematical research. A purely 'problem-solving' project can now be achieved by asking ChatGPT to provide LEAN code that verifies a solution to a mathematical problem. This, obviously, is not mathematical research in any reasonable sense, and therefore, I find Tsimerman's declarations about his passion for problem-solving to be somewhat reductive.

Research in mathematics is a human activity, done by humans, for humans, with the goal of advancing human understanding of certain formal structures. One might argue that this is unimportant or unnecessary in the age of AI, but it remains the essence of the field (though this does not mean the activity and evaluation of research won't change drastically in the near future). The value of the problems Tsimerman, or any other mathematician, has solved lies in helping people understand aspects of mathematics they previously could not, rather than confirming that some formal fact is assigned the truth value of "T".

Pascal *says:*

July 27, 2026 at 7:46 am

Getting proprer credit for problem solving is especially crucial for young people looking for a position, whether or not they have a competitive mindset.

Pasquale Di Cesare *says:*

July 27, 2026 at 8:46 am

If someone with your credentials does not spend lot of time to think about AI in math I really do not know who else can competently do it.
Just in case, this (public) document (52 pages) by Terence Tao features some of his thoughts about what the community should consider in general on AI, agents are not cited though. Coincidentally is brings the same date of your post.
https://teorth.github.io/tao-web/slides/age-of-ai-icm-2026.pdf

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John Baez *says:*
July 27, 2026 at 11:59 am

Most of the people who think math will be killed by AI don't seem to know much about what math is about. It's not about solving puzzles that someone throws at you. It's fundamentally not a competition – although like anything, you can try to make it into a competition if you want to. It's not about some people proving they're better than others. It's not about humans proving they're better than nonhumans. It's about understanding the deep patterns in reality.

If AI gets better than humans at understanding these patterns, so be it. Then math won't have died – it will have moved on.

John Baez *says:*
July 27, 2026 at 12:02 pm

Mawir wrote: "No professional mathematician wants to spend six months grinding through the technical details of a plausible conjecture looking for a counter-example or marginally improving a lower bound on a highly technical theorem."

That's news to me! I see plenty of professional mathematicians doing just that – and those that do, really enjoy it.

Madeleine Birchfield *says:*
July 27, 2026 at 1:12 pm

"Most of the people who think math will be killed by AI don't seem to know much about what math is about. It's not about solving puzzles that someone throws at you. It's fundamentally not a competition – although like anything, you can try to make it into a competition if you want to. It's not about some people proving they're better than others. It's not about humans proving they're better than nonhumans. It's about understanding the deep patterns in reality."

I wish, but the current structure of academia, with the publish or perish attitude prevalent throughout, kind of does make mathematics in academia a competition; you are competing against your fellow graduate students and postdocs for a limited number of tenured positions and research grant money from the government, and publishing results is a way for prospective mathematicians to distinguish themselves from their peers. So while mathematics as a field may move on, a lot of people currently trying to make a career out of mathematics in academia are going to find their career paths completely blocked and forced out of academia completely.

Perhaps governments decide that because AI is now competent at doing mathematics research, they can cut off grant funding for mathematicians. How much of mathematics research is currently being subsidized by the taxpayer that austerity promoting politicians are looking for an excuse to cut off? How many universities are going to get rid of tenured professors because their funding might be cut off thanks to AI, and replace them with cheaper lecturers who don't do research and don't have to go write proposals to the government for grant money to do research?

Anton *says:*
July 27, 2026 at 3:18 pm

Math may not die, but if the models keep getting better at it, a lot of the training we give to professional mathematicians will be obsoleted. There's heavy emphasis on problem solving and techniques to achieve them. My own competitive edge as a mathematician is also problem solving, (at a much more modest career, to be sure) and I was also relatively good at high school math competitions. I am seeing AI starting to overtake human capabilities at this specific competence in real time and it is certainly worrying.

Peter Woit *says:*
July 27, 2026 at 4:20 pm

Pasquale Di Cesare,
Thanks for the link to the Terry Tao slides.

I'm very much not an expert on what's going on with math and AI, because I basically haven't been using these new AI tools at all. Partly this is because I don't have access to the high-quality versions of them, and so have spent zero time using them. What I know of their capabilities is all second-hand information.
Reasons for not getting such access include unwillingness to pay our new overlords, laziness, and figuring that if I wait a bit it will become clear which if any of these things would actually be useful.

Peter Woit *says:*
July 27, 2026 at 4:37 pm

John Baez,

I don't think Tsimerman would say that what drives him is "deep patterns in reality". There are lots of people in math like him who have a talent for solving difficult, complicated puzzles, enjoy doing this, and find that they can be rewarded for it and make a career out of it.

His story is interesting because there's some evidence that it's this particular style of doing math that is going to get disrupted first, because it's exactly this kind of puzzle solving that AI agents are very good at.

Very unclear what this means for the future of that part of the field that like to do this kind of work. Can they keep going, supercharged by AI assistants? Even more unclear is whether these things will ever be helpful in the better understanding of deep patterns in reality that you and I both care about.

John Baez *says:*
July 28, 2026 at 5:57 pm

Yes, when I said math is about understanding the deep patterns in reality I was expressing *my opinion* about what math is really about – I wasn't talking about drives anyone in particular. I'm not shy about thinking that some people, even very successful ones, are fundamentally missing the point about some important things.

John Baez *says:*
July 28, 2026 at 6:25 pm

Peter wrote: "Even more unclear is whether these things will ever be helpful in the better understanding of deep patterns in reality that you and I both care about."

Someone gave me a subscription to Claude, and I couldn't resist trying it out. I'd rather know what's going on than stay pure… and ignorant of one of the most colossal developments in mathematics today.

I've found that Claude Opus 4.8 is a good way to learn algebraic geometry, nuclear physics, hadron physics, mineralogy and other things. (Those are just the things I've been studying lately.) It's like having an extremely well-read, voluble, sometimes glib, sometimes mistaken artificial tutor who never gets tired, enjoys writing programs to do calculations, and will happily write an essay of arbitrary length with references on any topic I want. I've used prompts to make it give me links to references whenever possible, so I can check what it's saying and read further. I enjoy asking questions, probing, and catching it in mistakes.

Opus 4.8 is noticeably better than Opus 4.6 – I can't stand Opus 4.6 anymore. A good mathematician I recently spoke to said that Fable is an equal step upward. He told me Anthropic is paying experts like him $250/hour to improve Fable by throwing hard math problems at it. They also get a separate account where they can use Fable for their own purposes. They can do this for 5 months maximum. He said he mainly uses it to learn things, and he's in awe of it.

Of course, it's worrisome that LLM companies are getting involved in mathematics this way. Their motives are self-interested, they don't really care about mathematics, and they don't care if they destroy the culture of mathematics. Even the mathematician I spoke to is worried about what mathematics grad students should do today.

Richard *says:*

July 29, 2026 at 3:24 pm

Peter,

I am at the ICM, where — not too long ago — I heard Graeme Segal's talk* "The Abstract Structure of Quantum Field Theory".
Though I understood nary a word, I suspect you and many of the readers of this blog would find it worth their while to take a look.

— Rich

* Segal could not make it to the ICM: his talk was presented as a video.

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nc *says:*

Your comment is awaiting moderation.

August 2, 2026 at 2:57 am

https://ai.vixra.org/abs/2608.0002
Unification by SL(4,C) Twistors

Proof checked by AI because folk such as the learned Dr Woit are too busy with political elitism to bother doing so.

Click to Edit – 4 minutes and 48 seconds

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